ANNEX 6

RESOLUTION MSC.354(92)
(Adopted on 21 June 2013)

AMENDMENTS TO THE INTERNATIONAL MARITIME SOLID BULK CARGOES (IMSBC) CODE

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

NOTING resolution MSC.268(85) by which it adopted the *International Maritime Solid Bulk Cargoes Code* (hereinafter referred to as "the IMSBC Code"), which has become mandatory under chapters VI and VII of the International Convention for the Safety of Life at Sea (SOLAS), 1974 (hereinafter referred to as "the Convention"),

NOTING ALSO article VIII(b) and regulation VI/1-1.1 of the Convention concerning the amendment procedure for amending the IMSBC Code,

HAVING CONSIDERED, at its ninety-second session, amendments to the IMSBC Code, proposed and circulated in accordance with article VIII(b)(i) of the Convention,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the IMSBC Code, the text of which is set out in the annex to the present resolution;

2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the said amendments shall be deemed to have been accepted on 1 July 2014, unless, prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50 per cent of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;

3. INVITES Contracting Governments to the Convention to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 January 2015 upon their acceptance in accordance with paragraph 2 above;

4. AGREES that Contracting Governments to the Convention may apply the aforementioned amendments in whole or in part on a voluntary basis as from 1 January 2014;

5. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Contracting Governments to the Convention;

6. ALSO REQUESTS the Secretary-General to transmit copies of this resolution and its annex to Members of the Organization which are not Contracting Governments to the Convention.

* * *

ANNEX

AMENDMENTS TO THE INTERNATIONAL MARITIME SOLID BULK CARGOES (IMSBC) CODE

Section 1 – General provisions

1.3 Cargoes not listed in this Code

1.3.3 Format for the properties of cargoes not listed in this Code and conditions of the carriage

1 At the end of the title, insert a footnote "*" with the following:

"* Refer to MSC.1/Circ.1453 on *Guidelines for the submission of information and completion of the format for the properties of cargoes not listed in the International Maritime Solid Bulk Cargoes (IMSBC) Code and their conditions of carriage*, according to subsection 1.3.3 of the IMSBC Code."

1.4 Application and implementation of this Code

2 Replace the last sentence of paragraph 1.4.2 with the following:

"The texts in the sections for "Description", "Characteristics (other than CLASS and GROUP)", "Hazard" and "Emergency procedures" of individual schedules of solid bulk cargoes in appendix 1."

1.7 Definitions

3 Insert the following new definitions in alphabetical order:

"*GHS* means the fourth revised edition of the Globally Harmonized System of Classification and Labelling of Chemicals, published by the United Nations as document ST/SG/AC.10/30/Rev.4."

"*Manual of Tests and Criteria* means the fifth revised edition of the United Nations publication entitled "Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria" (ST/SG/AC.10/11/Rev.5/Amendment 1)"

"*Potential sources of ignition* means, but is not limited to, open fires, machinery exhausts, galley uptakes, electrical outlets and electrical equipment unless they are of certified safe type*.

* For cargo spaces, refer to SOLAS II-2/19.3.2."

"*Sources of heat* means heated ship structures, where the surface temperature is liable to exceed 55ºC. Examples of such heated structures are steam pipes, heating coils, top or side walls of heated fuel and cargo tanks, and bulkheads of machinery spaces."

and all numerical references to definitions are deleted, keeping them in alphabetical order only.

4 Insert a new sentence at end of definition of *Competent authority* as follows:

"The competent authority shall operate independently from the shipper."

Section 3 – Safety of personnel and ship

3.6 Cargo under in-transit fumigation

5 The existing text under 3.6 is renumbered as 3.6.1.

6 Insert new paragraphs 3.6.2 and 3.6.3 as follows:

"3.6.2 When a fumigant is used, such as phosphine gas, for fumigation-in-transit, due consideration shall be given to the severe toxicity of fumigants, taking into account that fumigants may enter into occupied spaces despite many precautions taken. In particular, in the case that fumigant leaks from a cargo hold under fumigation, the possibility should be kept in mind that it may enter the engine-room via pipe tunnels, ducts, and piping of any kind, including wiring ducts on or below deck, or dehumidifier systems that may be connected to parts of the cargo hold or compartments of the engine-room. Attention shall be given to potential problem areas such as bilge and cargo line systems and valves*. In all cases, ventilation procedures on board the ship during the voyage, should be scrutinized with regard to the possibility of drawing in the fumigant gas such as by incorrect ventilation procedures and settings, vacuum creation due to incorrect closing devices or flap settings, air conditioning and closed loop ventilation of the accommodation. Prior to commencement of fumigation procedures, it should be verified that ventilation flaps and closing devices are set correctly and that means of closing and sealing of all the bulkhead openings (such as doors and manholes) leading from the engine-room to piping tunnels/duct keels and other spaces that in case of leaks could become unsafe to enter during the fumigation are effective, confirmed closed and have warning signs posted.*

* Refer to subsection 3.3.2.10 of MSC.1/Circ.1264 as amended by MSC.1/Circ.1396.

3.6.3 Gas concentration safety checks shall also be made at all appropriate locations, which shall at least include: accommodation; engine-rooms; areas designated for use in navigation of the ship; and frequently visited working areas and stores, such as the forecastle head spaces, adjacent to cargo holds being subject to fumigation in transit, shall be continued throughout the voyage at least at eight-hour intervals or more frequently if so advised by the fumigator-in-charge. Special attention shall also be paid to potential problem areas such as bilge and cargo line systems. These readings shall be recorded in the ship's logbook."

Section 4 – Assessment of acceptability of consignments for safe shipment

4.3 Certificates of test

7 Replace the first sentence of paragraph 4.3.2 with the following:

"When a concentrate or other cargo which may liquefy is carried, the shipper shall provide the ship's master or his representative with a signed certificate of the TML, and a signed certificate or declaration of the moisture content, each issued by an entity recognized by the Competent Authority of the port of loading."

8 Insert new paragraph 4.3.3 with the accompanying footnote as follows:

"4.3.3 When a concentrate or other cargo which may liquefy is carried, procedures for sampling, testing and controlling moisture content to ensure the moisture content is less than the TML when it is on board the ship shall be established by the shipper, taking account of the provisions of this Code. Such procedures shall be approved and their implementation checked by the competent authority of the port of loading*. The document issued by the competent authority stating that the procedures have been approved shall be provided to the master or his representative.

* Refer to MSC.1/Circ1454 on *Guidelines for developing and approving procedures for sampling, testing and controlling the moisture content for solid bulk cargoes which may liquefy*."

9 Insert new paragraph 4.3.4 as follows:

"4.3.4 If the cargo is loaded on to the ship from barges, in developing the procedures under 4.3.3 the shipper shall include procedures to protect the cargo on the barges from any precipitation and water ingress."

and renumber the existing paragraphs 4.3.3 and 4.3.4 as 4.3.5 and 4.3.6, respectively.

10 A new sentence is inserted to the end of the new paragraph 4.3.6 as follows:

"However, it is important to ensure that the samples taken are representative of the whole depth of the stockpile."

4.4 Sampling procedures

11 Insert new paragraph 4.4.3 as follows:

"4.4.3 For a concentrate or other cargo which may liquefy, the shipper shall facilitate access to stockpiles for the purpose of inspection, sampling and subsequent testing by the ship's nominated representative."

12 Renumber the existing paragraphs 4.4.3, 4.4.4, 4.4.5 and 4.4.6 as 4.4.4, 4.4.5, 4.4.6 and 4.4.7, respectively.

13 In the renumbered paragraph 4.4.6, replace the sentence "Samples shall be immediately placed in suitable sealed containers which are properly marked" with the sentence "Samples for moisture testing shall be immediately placed in suitable airtight, non-absorbent containers with a minimum of free air space to minimize any change in moisture content, such containers being properly marked".

14 Insert a new paragraph 4.4.8 as follows:

"4.4.8 For unprocessed mineral ores the sampling of stationary stockpiles shall be carried out only when access to the full depth of the stockpile is available and samples from the full depth of the stockpile can be extracted."

15 In subsection 4.7, the existing reference "ISO 3082:1998" is replaced with the following:

"ISO 3082:2009 – Iron ores – Sampling and sample preparation procedures.

(Note: Under this Standard the in situ sampling of ships and stockpiles is not permitted)."

16 A new reference in subsection 4.7 is inserted after "ISO 3082:2009" as follows:

"IS1405:2010 – Iron Ores – Sampling & Sample Preparation – Manual Method.

(Note: This Indian Standard covers the in situ sampling of stockpiles up to a height of 3 m)."

Section 7 – Cargoes that may liquefy

7.2 Conditions for hazards

17 The existing paragraph 7.2.2 is replaced with the following:

"7.2.2 Liquefaction does not occur when the cargo consists of large particles or lumps and water passes through the spaces between the particles and there is no increase in the water pressure."

Section 8 – Test procedures for cargoes that may liquefy

8.4 Complementary test procedure for determining the possibility of liquefaction

18 The existing paragraph under subsection 8.4 is numbered as 8.4.1.

19 Insert a new paragraph 8.4.2 as follows:

"8.4.2 If samples remain dry following a can test, the moisture content of the material may still exceed the Transportable Moisture Limit (TML)."

Section 9 – Materials possessing chemical hazards

9.2 Hazard classification

9.2.3 *Materials hazardous only in bulk (MHB)*

20 In paragraph 9.2.3, replace the existing text under the heading with the following:

"**9.2.3.1 General**

9.2.3.1.1 These are materials which possess chemical hazards when transported in bulk other than materials classified as packaged dangerous goods in the IMDG Code. These materials present a significant risk when carried in bulk and require special precautions.

9.2.3.1.2 A material shall be classified as MHB if the material possesses one or more of the chemical hazards as defined below. When a test method is prescribed, representative samples of the cargo to be carried shall be used for testing. Samples shall be taken 200 to 360 mm inward from the surface at 3 m intervals over the length of a stockpile.

9.2.3.1.3 A material may also be classified as MHB by analogy with similar cargoes with known hazardous properties or by records of accidents.

9.2.3.2 Combustible solids

9.2.3.2.1 These are materials which are readily combustible or easily ignitable when transported in bulk and do not meet the established criteria for inclusion in class 4.1 (see 9.2.2.1 of the IMSBC Code).

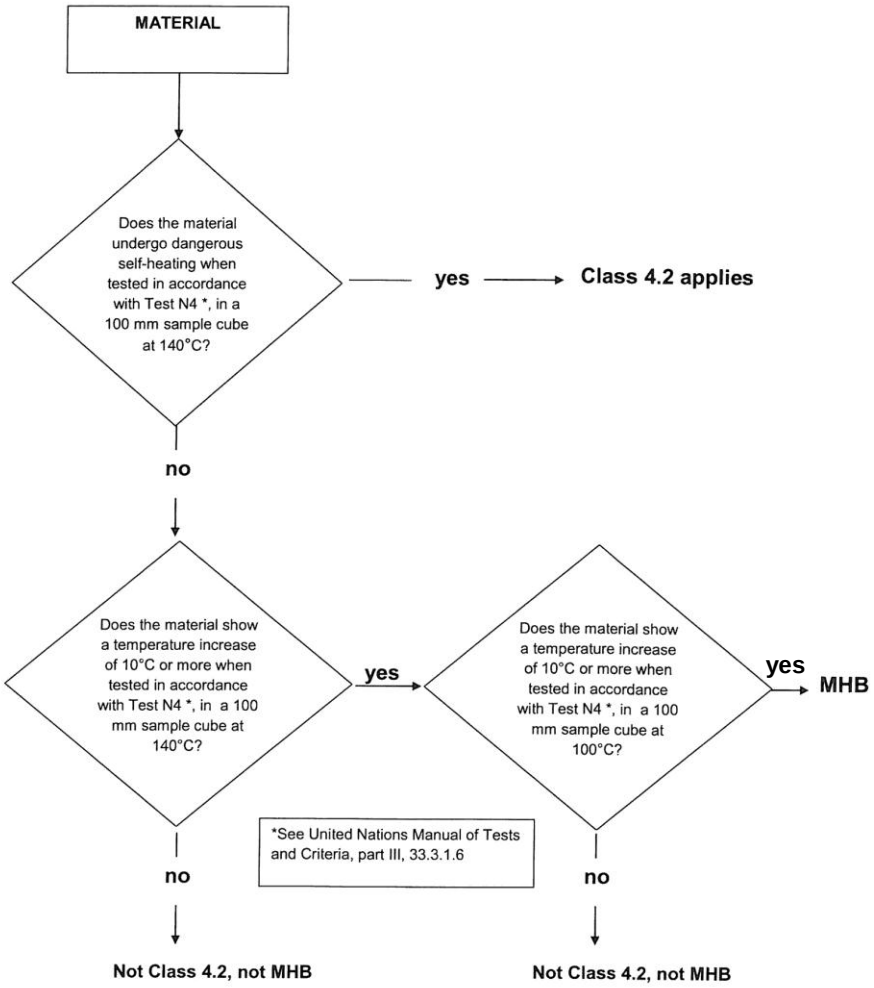
9.2.3.2.2 Powdered, granular or pasty materials shall be classified as MHB when the time of burning of one or more of the test runs, performed in accordance with the preliminary screening test method described in the United Nations Manual of Tests and Criteria, part III, 33.2.1.4.3.1, is less than 2 minutes. Powders of metals or metal alloys shall be classified as MHB when they can be ignited and the reaction spreads over the whole length of the sample in 20 minutes or less. The test sample in the preliminary screening test is 200 mm in length. A summary of this approach is presented in the table below:

Solid Cargo	**Hazard Class 4.1, PG III Burn time, Burn distance**	**MHB Burn time, Burn distance**
Powdered Metal	more than 5 minutes but not more than 10 minutes, 250 mm	≤20 minutes, 200 mm
Solid Material	<45 seconds, 100 mm	≤2 minutes, 200 mm

9.2.3.3 Self-heating solids

9.2.3.3.1 These are materials that self-heat when transported in bulk and do not meet the established criteria for inclusion in class 4.2 (see 9.2.2.2).

9.2.3.3.2 A material shall be classified as MHB if, in the tests performed in accordance with the test method given in the United Nations Manual of Tests and Criteria, part III, 33.3.1.6, the temperature of the test sample rises by more than 10°C when using a 100 mm cube sample at 140°C and at 100°C. The flow chart below illustrates the test procedure.



9.2.3.3.3 In addition, a material shall be classified as MHB if a temperature rise of 10°C or more over ambient temperature is observed during any portion of the test performed in accordance with the test method described in United Nations Manual of Tests and Criteria, part III, 33.4.1.4.3.5. When performing this test, the temperature of the sample should be measured continuously over 48 hours. If, at the end of the 48-hour period the temperature is increasing, the test period shall be extended in accordance with the test method.

9.2.3.4 Solids that evolve into flammable gas when wet

9.2.3.4.1 These are materials that emit flammable gases when in contact with water when transported in bulk and do not meet established criteria for inclusion in class 4.3 (see 9.2.2.3).

9.2.3.4.2 A material shall be classified as MHB if, in tests performed in accordance with the test method given in the United Nations Manual of Tests and Criteria, part III, 33.4.1, the flammable gas evolution rate is greater than zero. When performing this test, the rate of evolution of gas shall be calculated over 48 hours at one-hour intervals. If at the end of the 48-hour period the rate of evolution is increasing, the test period shall be extended in accordance with the test method.

9.2.3.5 Solids that evolve toxic gas when wet

9.2.3.5.1 These are materials that emit toxic gases when in contact with water when transported in bulk.

9.2.3.5.2 A material shall be classified as MHB if, in tests performed in accordance with the test method given in the United Nations Manual of Tests and Criteria, part III, 33.4.1, the toxic gas evolution rate is greater than zero. Toxic gas evolution shall be measured using the same test procedure for flammable gas evolution as prescribed in the test method. When performing this test, the rate of evolution of gas shall be calculated over 48 hours at 1-hour intervals. If at the end of the 48-hour period the rate of evolution is increasing, the test period shall be extended in accordance with the test method.

9.2.3.5.3 The gas shall be collected over the test period prescribed above. The gas shall be chemically analysed and tested for toxicity if the gas is unknown and no acute inhalation toxicity data is available. If the gas is known, inhalation toxicity shall be assessed based on all information available, using testing as a last resort option for concluding this hazard. Toxic gases in this respect are gases showing acute inhalation toxicity (LC_{50}) of or below 20,000 ppmV or 20 mg/l by 4 hours' testing (GHS Acute Toxicity Gases/Vapours Category 4).

9.2.3.6 Toxic solids

9.2.3.6.1 These are materials that have toxic hazards to humans if inhaled or with contact with skin when loaded, unloaded, or transported in bulk and do not meet the established criteria for inclusion in class 6.1 (see 9.2.2.5).

9.2.3.6.2 A material shall be classified as MHB in accordance with the criteria laid down within part 3 of the GHS:

.1 cargoes developing cargo dust with an acute inhalation toxicity (LC_{50}) of 1-5 mg/l by 4 hours testing (GHS Acute Toxicity Dusts Category 4);

.2 cargoes developing cargo dust exhibiting an inhalation toxicity of equal to or less than 1 mg/litre/4h (GHS Specific Target Organ Toxicity Single Exposure Inhalation Dust Category 1) or below 0.02 mg/litre/6h/d (GHS Specific Target Organ Toxicity Repeated Dose Inhalation Dust Category 1);

.3 cargoes exhibiting an acute dermal toxicity (LD_{50}) of 1,000-2,000 mg/kg (GHS Acute Toxicity Dermal Category 4);

.4 cargoes exhibiting a dermal toxicity of or below 1000 mg (GHS Specific Target Organ Toxicity Single Exposure Dermal Category 1) or below 20 mg/kg bw/d by 90 days testing (GHS Specific Target Organ Toxicity Repeated Dose Dermal Category 1);

.5 cargoes exhibiting carcinogenicity (GHS Category 1A and 1B), mutagenicity (GHS Category 1A and 1B) or reprotoxicity (GHS Category 1A and 1B).

9.2.3.7 Corrosive solids

9.2.3.7.1 These are materials that are corrosive to skin, eye or to metal or are respiratory sensitizers and do not meet the established criteria for inclusion in class 8 (see 9.2.2.7).

9.2.3.7.2 A material shall be classified as MHB in accordance with the criteria laid down within part 3 of the GHS:

.1 cargoes which are known to be a respiratory sensitizer (GHS Respiratory Sensitization Category 1);

.2 cargoes exhibiting skin irritation with a mean value of or higher than 2.3 for erythema/eschar or oedema (GHS Skin Corrosion/Irritation Category 2);

.3 cargoes exhibiting eye irritation with a mean value of or higher than 1 for corneal opacity/irititis or 2 for conjunctival redness/oedema (GHS Serious Eye Damage Category 1 or Eye Irritation Category 2A).

9.2.3.7.3 A material shall be classified as MHB when the corrosion rate on either steel or aluminium surfaces is between 4 mm and 6.25 mm a year at a test temperature of 55°C when tested on both materials. For the purposes of testing steel, type S235JR+CR (1.0037 resp. St 37-2), S275J2G3+CR (1.0144 resp. St 44-3), ISO 3574:199, Unified Numbering Systems (UNS) G10200 or SAE 1020, and for testing aluminium, non-clad, types 7075-T6 or AZ5GU T6 shall be used. An acceptable test is prescribed in the United Nations Manual of Tests and Criteria, part III, section 37. When this test is performed the sample shall contain at least 10% moisture by mass. If the representative sample of the cargo to be shipped does not contain more than 10% moisture by mass, water shall be added to the sample."

Appendix 1 – Individual schedules of solid bulk cargoes

AMMONIUM NITRATE UN 1942
with not more than 0.2% total combustible material, including any organic substance, calculated as carbon to the exclusion of any other added substance

21 In the section for Stowage and Segregation replace the sentence "There shall be no sources of heat or ignition in the cargo space." with the sentence "Separated from" sources of heat or ignition (*see also* **Loading**)."

22 In the section for Loading, insert as the first sentence the following:

"This cargo shall not be loaded in cargo spaces adjacent to fuel oil tank(s), unless heating arrangements for the tank(s) are disconnected and remain disconnected during the entire voyage."

AMMONIUM NITRATE-BASED FERTILIZER UN 2067

23 The following text contained in the section for Description, is moved under the Bulk Cargo Shipping Name:

"Ammonium nitrate-based fertilizers classified as UN 2067 are uniform mixtures containing ammonium nitrate as the main ingredient within the following composition limits:

.1 not less than 90% ammonium nitrate with not more than 0.2% total combustible/organic material calculated as carbon and with added matter, if any, which is inorganic and inert towards ammonium nitrate; or

.2 less than 90% but more than 70% ammonium nitrate with other inorganic materials or more than 80% but less than 90% ammonium nitrate mixed with calcium carbonate and/or dolomite and/or mineral calcium sulphate and not more than 0.4% total combustible/organic material calculated as carbon; or

.3 ammonium nitrate-based fertilizers containing mixtures of ammonium nitrate and ammonium sulphate with more than 45% but less than 70% ammonium nitrate and not more than 0.4% total combustible organic material calculated as carbon such that the sum of the percentage compositions of ammonium nitrate and ammonium sulphate exceeds 70%."

24 In the section for Stowage and Segregation, the text "Not to be stowed immediately adjacent to any tank, double bottom or pipe containing fuel oil heated to more than 50°C" is replaced with the following:

"Not to be stowed immediately adjacent to any tank, double bottom or pipe containing heated fuel oil unless there are means to monitor and control the temperature so that it does not exceed 50°C."

AMMONIUM NITRATE-BASED FERTILIZER UN 2071

25 The following text contained in the section for Description, is moved under the Bulk Cargo Shipping Name:

"Ammonium nitrate-based fertilizers classified as UN 2071 are uniform ammonium nitrate based fertilizer mixtures of the nitrogen, phosphate or potash, containing not more than 70% ammonium nitrate and not more than 0.4% total combustible organic material calculated as carbon or with not more than 45% ammonium nitrate and unrestricted combustible material. Fertilizers within these composition limits are not subject to the provisions of this schedule when shown by a trough test* that they are not liable to self-sustaining decomposition.

* See UN Manual of Tests and Criteria, part III, subsection 38.2."

26 In the section for Stowage and Segregation, the text "Not to be stowed immediately adjacent to any tank or double bottom containing fuel oil heated to more than 50°C" is replaced with the following:

> "Not to be stowed immediately adjacent to any tank, double bottom or pipe containing heated fuel oil unless there are means to monitor and control the temperature so that it does not exceed 50°C."

AMMONIUM NITRATE-BASED FERTILIZER (non-hazardous)

27 The following text contained in the section for Description, is moved under the Bulk Cargo Shipping Name:

> "Ammonium nitrate based fertilizers transported in conditions mentioned in this schedule are uniform mixtures containing ammonium nitrate as the main ingredient within the following composition limits:
>
> .1 not more than 70% ammonium nitrate with other inorganic materials;
>
> .2 not more than 80% ammonium nitrate mixed with calcium carbonate and/or dolomite and/or mineral calcium sulphate and not more than 0.4% total combustible organic material calculated as carbon;
>
> .3 nitrogen type ammonium nitrate based fertilizers containing mixtures of ammonium nitrate and ammonium sulphate with not more than 45% ammonium nitrate and not more than 0.4% total combustible organic material calculated as carbon; and
>
> .4 uniform ammonium nitrate based fertilizer mixtures of nitrogen, phosphate or potash, containing not more than 70 % ammonium nitrate and not more than 0.4% total combustible organic material calculated as carbon or with not more than 45% ammonium nitrate and unrestricted combustible material. Fertilizers within these composition limits are not subject to the provisions of this schedule when shown by a trough test* that they are liable to self-sustaining decomposition or if they contain an excess of nitrate greater than 10% by mass."

and its corresponding footnote is amended as follows:

"* See UN Manual of Tests and Criteria, part III, subsection 38.2."

28 In the section Stowage and Segregation the text "Not to be stowed immediately adjacent to any tank, double bottom or pipe containing fuel oil heated to more than 50°C" is replaced with the following:

> "Not to be stowed immediately adjacent to any tank, double bottom or pipe containing heated fuel oil unless there are means to monitor and control the temperature so that it does not exceed 50°C."

CALCIUM NITRATE UN 1454

29 The following text contained in the section for Description, is moved under the Bulk Cargo Shipping Name:

> "The provisions of this Code shall not apply to the commercial grades of calcium nitrate fertilizers consisting mainly of a double salt (calcium nitrate and ammonium nitrate) and containing not more than 10% ammonium nitrate and at least 12% water of crystallization."

CALCIUM NITRATE FERTILIZER

30 The following text is inserted under the Bulk Cargo Shipping Name:

> "The provisions of this schedule shall apply only for cargoes containing not more than 15.5% total nitrogen and at least 12% water."

31 The following text is deleted from the section for Description:

> "and containing not more than 15.5% total nitrogen and at least 12% water".

CHARCOAL

32 The following text contained in the section for Hazard, is moved at the end in the section for Loading:

> "Hot charcoal screenings in excess of 55°C shall not be loaded."

FERROUS METAL BORINGS, SHAVINGS, TURNINGS or CUTTINGS UN 2793

33 The following text contained in the section for Description is moved under the Bulk Cargo Shipping Name:

> "This schedule shall not apply to consignments of materials which are accompanied by a declaration submitted prior to loading by the shipper and stating that they have no self-heating properties when transported in bulk."

METAL SULPHIDE CONCENTRATES

34 The following text contained in the section for Hazard, is moved at the end in the section for Precautions:

> "When a Metal Sulphide Concentrate is considered as presenting a low fire-risk, the carriage of such cargo on a ship not fitted with a fixed gas fire extinguishing system shall be subject to the Administration's authorization as provided by SOLAS regulation II-2/10.7.1.4."

PEAT MOSS

35 The following text contained in the section for Hazard, is moved at the end in the section for Loading:

> "Peat Moss having a moisture content of more than 80% by weight shall only be carried on specially fitted or constructed ships (see paragraph 7.3.2 of this Code)."

SAND

36 The following text is inserted under the Bulk Cargo Shipping Name:

"Sands included in this schedule are:

Foundry sand	Silica sand
Potassium felspar sand	Soda felspar sand"
Quartz sand	

37 The following text in the section for Description is deleted:

"Sands included in this schedule are:

FOUNDRY SAND	SILICA SAND
POTASSIUM FELSPAR SAND	SODA FELSPAR SAND"
QUARTZ SAND	

SEED CAKE
containing vegetable oil UN 1386(b) solvent extractions and expelled seeds, containing not more than 10% of oil and when the amount of moisture is higher than 10%, not more than 20% of oil and moisture combined.

38 The following text is inserted under the Bulk Cargo Shipping Name:

"The provisions of this schedule shall not apply to:

.1 solvent extracted rape seed meal, soya bean meal, cotton seed meal and sunflower seed meal, containing not more than 4% oil and 15% oil and moisture combined and being substantially free from flammable solvents;

.2 mechanically expelled citrus pulp pellets containing not more than 2.5% oil and 14% oil and moisture combined;

.3 mechanically expelled corn gluten meal containing not more than 11.0% oil and 23.6% oil and moisture combined;

.4 mechanically expelled corn gluten feed pellets containing not more than 5.2% oil and 17.8% oil and moisture combined; and

.5 mechanically expelled beet pulp pellets containing not more than 2.8% oil and 15.0% oil and moisture combined.

A certificate from a person recognized by the competent authority of the country of shipment shall be provided by the shipper, prior to loading, stating that the provisions of the exemption are met."

39 In the section for Description, the following paragraph is deleted:

"The provisions of this schedule should not apply to solvent extracted rape seed meal, pellets, soya bean meal, cotton seed meal and sunflower seed meal, containing not more than 4% oil and 15% oil and moisture combined and being substantially free from flammable solvents. The provisions of this schedule also apply to mechanically expelled citrus pulp pellets containing not more that 2.5% oil and 14% oil and moisture combined. A certificate from a person recognized by the competent authority of the country of shipment should be provided by the shipper, prior to loading, stating that the provisions of the exemption are met."

SEED CAKE (non-hazardous)

40 The following text is inserted under the Bulk Cargo Shipping Name:

"The provisions of this schedule shall only apply to:

.1 solvent extracted rape seed meal, soya bean meal, cotton seed meal and sunflower seed meal, containing not more than 4% oil and 15% oil and moisture combined and being substantially free from flammable solvents;

.2 mechanically expelled citrus pulp pellets containing not more than 2.5% oil and 14% oil and moisture combined;

.3 mechanically expelled corn gluten meal containing not more than 11.0% oil and 23.6% oil and moisture combined;

.4 mechanically expelled corn gluten feed pellets containing not more than 5.2% oil and 17.8% oil and moisture combined; and

.5 mechanically expelled beet pulp pellets containing not more than 2.8% oil and 15.0% oil and moisture combined."

41 In the section for Description, the following text is deleted:

"The provisions of this schedule apply to solvent extracted rape seed meal, pellets, soya bean meal, cotton seed meal and sunflower seed meal, containing not more than 4% oil and 15% oil and moisture combined and being substantially free from flammable solvents. The provisions of this schedule also apply to mechanically expelled citrus pulp pellets containing not more than 2.5% oil and 14% oil and moisture combined."

and the following text contained in the section for Description, is moved at the end of the section for Loading:

"A certificate from a person recognized by the competent authority of the country of shipment shall be provided by the shipper, prior to loading, stating that the requirements for exemption as set out either in the schedule for seed cake UN 1386 (b) or UN 2217, whichever is applicable, are met."

SILICOMANGANESE (low carbon)
with known hazard profile or known to evolve gases with silicon content of 25% or more

42 In the Bulk Cargo Shipping Name, delete the words "**with known hazard profile or known to evolve gases with silicon content of 25% or more**".

43 Replace the existing text under the section for Description, with the following:

"A ferroalloy comprising principally manganese and silicon, mainly used as a deoxidizer and alloying element in the steel-making process. Particle or lump of blackish brown, silver white metal."

44 The existing table of Characteristics is replaced with the following:

"

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
Not applicable	3,000 to 3,300	0.30 to 0.33
Size	**Class**	**Group**
10 mm to 150 mm	MHB	B

"

45 Replace the existing text under the section for Hazard, with the following:

"This cargo is non-combustible and has a low fire-risk. However, in contact with water this cargo may evolve hydrogen, a flammable gas that may form explosive mixtures with air and may, under similar conditions, produce phosphine and arsine, which are highly-toxic gases. This cargo is liable to reduce oxygen content in a cargo space. May cause long-term health effect."

46 In the section for Precautions, the following text is deleted:

"Prohibition of smoking in dangerous areas shall be enforced, and clearly legible "NO SMOKING" signs shall be displayed. Electrical fittings and cables shall be in good condition and properly safeguarded against short circuits and sparking. Where a bulkhead is required to be suitable for segregation purposes, cable and conduit penetrations of the decks and bulkheads shall be sealed against the passage of gas and vapour. Ventilation systems shall be shut down or screened and air condition systems, if any, placed on recirculation during loading or discharge, in order to minimize the entry of dust into living quarters or other interior spaces of the ship. Precautions shall be taken to minimize the extent to which dust may come in contact with moving parts of deck machinery and external navigation aids (e.g. navigation lights)."

SULPHUR (formed, solid)

47 The following text contained in the section for Description, is moved under the Bulk Cargo Shipping Name:

"This schedule shall not apply to crushed, lump and coarse-grained sulphur (see SULPHUR UN 1350), or to co-products from sour gas processing or oil refinery operations NOT subjected to the above-described forming process."

48 Insert the following new individual schedules accordingly in alphabetical order:

"**ALUMINA HYDRATE**

Description
Alumina hydrate is a fine, moist, white (light coloured), odourless powder. Insoluble in water and organic liquids.

Characteristics

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
Not applicable	500 to 1,500	0.67 to 2.0
Size	**Class**	**Group**
Fine powder	MHB	A and B

Hazard
This cargo may liquefy if shipped at moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of the Code. Alumina Hydrate dust is very abrasive and penetrating. Irritating to eyes, skin and mucous membranes. This cargo is non-combustible or has low fire-risks.

Stowage and segregation
Separated from oxidizing materials.

Hold cleanliness
Clean and dry as relevant to the hazards of the cargo.

Weather precautions
When a cargo is carried in a ship other than a specially constructed or fitted cargo ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

.1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;

.2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;

.3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;

.4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and

.5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

Precautions
Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo. Bilge system of a cargo space to which this cargo is to be loaded shall be tested to ensure it is working. Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Due consideration shall be paid to protect equipment from the dust of the cargo. Persons who may be exposed to the dust of the cargo shall wear goggles or other equivalent dust eye-protection and dust filter masks. Those persons shall wear protective clothing, as necessary.

Ventilation
No special requirements.

Carriage
The appearance of the surface of this cargo shall be checked regularly during voyage. If free water above the cargo or fluid state of the cargo is observed during voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge.

Discharge
No special requirements.

Clean-up
The water used for the cleaning of the cargo spaces, after discharge of this cargo, shall not be pumped by the fixed bilge pumps. A portable pump shall be used, as necessary, to clear the cargo spaces of the water.

Emergency procedures

Special emergency equipment to be carried Protective clothing (gloves, boots, coveralls, headgear). Self-contained breathing apparatus.
Emergency procedures Wear protective clothing and self-contained breathing apparatus **Emergency action in the event of fire** Nil (non-combustible) **Medical First Aid** Refer to the Medical First Aid Guide (MFAG), as amended.

"

"**ALUMINIUM SMELTING / REMELTING BY-PRODUCTS, PROCESSED**

The provisions of this schedule shall not apply to ALUMINIUM SMELTING BY-PRODUCTS or ALUMINIUM REMELTING BY-PRODUCTS UN 3170.

Description
Product obtained by treating the by-products of merging/recasting of aluminium with water and/or alkalis solutions to render the material less reactive with water. A damp powder with a slight smell of ammonia.

Characteristics

Angle of repose	Bulk density (kg/ m^3)	Stowage factor (m^3/t)
Not applicable	1,080 to 1,750	0.57 to 0.93
Size	**Class**	**Group**
Less than 1 mm	MHB	A and B

Hazard
This cargo may develop small amount of hydrogen, a flammable gas which may form explosive mixtures with air, and of ammonia, which is a highly toxic gas.
This cargo may liquefy if shipped at moisture content in excess of its transportable moisture limit (TML). See sections 7 and 8 of the Code. Corrosive to eyes.

Stowage and segregation
"Separated from" foodstuffs and all Class 8 liquids. Segregation as for Class 4.3 materials.

Hold cleanliness
Clean and dry as relevant to the hazards of the cargo.

Weather precautions
This cargo shall be kept as dry as practicable and the moisture content shall be kept less than its TML during loading operations and the voyage. This cargo shall not be handled during precipitation. During handling of this cargo, all non-working hatches of the cargo spaces into which this cargo is loaded or to be loaded shall be closed.

Loading
Trim in accordance with the relevant provisions of sections 4 and 5 of this Code.

Precautions
Persons who may be exposed to the cargo shall wear personal protective equipment, including goggles and/or skin protection as necessary. Prior to loading this cargo, a weathering certificate shall be provided by the manufacturer or shipper stating that, after manufacture, the material was stored under cover, but exposed to the weather in the particle size to be shipped, for not less than four weeks prior to shipment. Whilst the ship is alongside and the hatches of the cargo spaces containing this cargo are closed, the mechanical ventilation shall be operated continuously as weather permits. During handling of this cargo, "NO SMOKING" signs shall be posted on decks and in areas adjacent to cargo spaces and no naked lights shall be permitted in these areas. Bulkheads between the cargo spaces and the engine-room shall be gastight. Inadvertent pumping through machinery spaces shall be avoided. Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo.

Ventilation
Continuous mechanical ventilation shall be conducted during the voyage for the cargo spaces carrying this cargo. If maintaining ventilation endangers the ship or the cargo, it may be interrupted unless there is a risk of explosion or other danger due to interruption of the ventilation. In any case, mechanical ventilation shall be maintained for a reasonable period prior to discharge. Ventilation shall be arranged such that any escaping gases are minimized from reaching living quarters on or under the deck.

Carriage
For quantitative measurements of hydrogen, ammonia and acetylene, suitable detectors for each gas or combination of gases shall be on board while this cargo is carried. The detectors shall be of certified safe type for use in explosive atmosphere. The concentrations of these gases in the cargo spaces carrying this cargo shall be measured regularly, during voyage, and the results of the measurements shall be recorded and kept on board. The appearance of the surface of this cargo shall be checked regularly during voyage. If free water above the cargo or fluid state of the cargo is observed during voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge. Hatches of the cargo spaces carrying this cargo shall be weathertight to prevent the ingress of water.

Discharge
No special requirements.

Clean-up
Persons who may be exposed to the cargo shall wear personal protective equipment including goggles and/or skin protection as necessary. After discharge of this cargo, the bilge wells and scuppers of the cargo spaces shall be checked and any blockage shall be removed.

Prior to using water for hold cleaning, holds should be swept to remove as much cargo residues as practicable.

Emergency procedures

Special emergency equipment to be carried
Nil
Emergency procedures
Nil
Emergency action in the event of fire
Batten down and use CO_2 if fitted
Medical first aid
Refer to the Medical First Aid Guide (MFAG), as amended

"

"**CLINKER ASH, WET**

Description
Coal ash discharged from coal-fired power stations. Grey-coloured, possibly ranging from near-white to near-black, and odourless substance collected from the bottom of boilers, and resembles sand. Moisture content is about 15% to 23%. Insoluble in water.

Characteristics

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
Not applicable	600 to 1,700	0.6 to 1.7
Size	**Class**	**Group**
Up to 90 mm	MHB	A and B

Hazard
The material may liquefy if shipped at a moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of the Code. May cause long-term health effects. This cargo is non-combustible or has a low fire-risk.

Stowage and Segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather precautions
This cargo shall be kept as dry as practicable before loading, during loading and while on the voyage. When a cargo is carried in a ship other than a specially constructed or fitted cargo ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

.1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;

.2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;

.3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;

.4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and

.5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

Precautions
Persons who may be exposed to the dust of the cargo shall wear gloves, goggles or other equivalent dust eye-protection and dust filter masks.

Ventilation
No special requirements.

Carriage
No special requirements.

Discharge
No special requirements.

Clean-Up
No special requirements.

Emergency procedures

Special emergency equipment to be carried Protective clothing (goggles, dust filter masks, gloves, coveralls).
Emergency procedures Wear protective clothing. **Emergency action in the event of fire** Nil (non-combustible) **Medical First Aid** Refer to the Medical First Aid Guide (MFAG), as amended.

"

"**COAL TAR PITCH**

Description
A coarse distilled residue of Coal Tar, a by-product of Cokes production. Mostly comprises many kinds of polycyclic aromatic hydrocarbon. A black solid at ambient temperature. It is insoluble in water. A raw material in use for electrodes and materials covering pitch bound on metallurgy coke. The moisture content is up to 6%.

Characteristics

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
Not applicable	600 to 1,100	0.9 to 1.7
Size	**Class**	**Group**
Up to 100mm 0 to 10% of fine particles: less than 1 mm	MHB	B

Hazard
This cargo is non-combustible or has a low fire-risk. When heated, it melts and turns into inflammable liquid. It softens between 70°C and 120°C. Corrosive to eyes. May cause long-term health effects.

Stowage and segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather precautions
No special requirements.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

Precautions
Persons who may be in contact with this cargo shall be supplied with protective gloves, dust masks, protective clothing and goggles.

Ventilation
No special requirements.

Carriage
No special requirements.

Discharge
No special requirements.

Clean-up
No special requirements.

Emergency procedures

Special emergency equipment to be carried Protective clothing (gloves, boots, overalls, headgear, dust masks and goggles).
Emergency procedures Wear protective clothing, protective gloves, dust masks and goggles. **Emergency action in the event of fire** Batten down: use ship's fixed fire-fighting installation if fitted. Exclusion of air may be sufficient to control fire. **Medical first aid** Refer to the Medical First Aid Guide (MFAG), as amended.

"

"**COARSE IRON AND STEEL SLAG AND ITS MIXTURE**

Description

A coarse slag arising from iron and steel manufacture, and a coarse slag mixed with one of the following substances or a combination thereof: concrete debris, fly-ash, firebricks, dust collected from iron/steel-making processes, refractory material debris and fine raw materials of iron making.

This cargo includes shaped blocks made of iron and steel slag with one of the additives or a combination of additives: cement, ground granulated blast furnace slag and fly-ash, and its debris, and their mixture with iron and steel slag.

The colour is in the range from greyish-white to dark grey, and the appearance is in the range from granulated, pebble to block shaped.

Characteristics

Angle of repose	**Bulk density (kg/m^3)**	**Stowage factor (m^3/t)**
Not applicable	1,200 to 3,000	0.33 to 0.83
Size	**Class**	**Group**
90 to 100% of lumps: up to 300 mm 0 to 10% fine particles: less than 1 mm	Not applicable	C

Hazard
No special requirements.
This cargo is non-combustible or has a low fire-risk.

Stowage and segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather precautions
No special requirements.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

When the stowage factor of this cargo is equal or less than 0.56 m^3/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo.

Precautions
Persons who may be exposed to the dust of the cargo shall wear goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

Ventilation
No special requirements.

Carriage
No special requirements.

Discharge
No special requirements.

Clean-up
No special requirements."

"**CRUSHED CARBON ANODES**

Description
Crushed Carbon Anodes are spent carbon anodes that are crushed into smaller pieces to permit their shipment for recycling. Carbon anodes are used to introduce electricity into the aluminium smelter pots. This cargo is mainly composed of black crushed lumps and pieces principally containing carbon and other impurities. The material is odourless.

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
Not applicable	800 to 1,000	1.00 to 1.25
Size	**Class**	**Group**
Mainly coarse pieces up to 60 cm +	Not applicable	C

Hazard
This cargo may generate dust. This cargo is non-combustible or has a low fire-risk.

Stowage and segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather precautions
No special requirements.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

Precautions
Persons who may be exposed to the dust of the cargo shall wear protective clothing, goggles or other equivalent dust eye-protection, dust filter mask and barrier creams as necessary.

Ventilation
No special requirements.

Carriage
No special requirements.

Discharge
No special requirements.

Clean-up
No special requirements."

"**GRAIN SCREENING PELLETS**

The provision of this schedule shall apply only to Grain Screening Pellets material containing not more than 6.2% oil content and not more than 17.5% oil and moisture content combined.

Description
Grain Screening Pellets are animal feed products, pelletized animal feed derived from dockage removed from grains. Screenings means dockage that has been removed from grain that does not qualify for any other grain grades. Depending

upon their quality, screenings vary in level of parent and volunteer grain material, broken or shrunken kernels, hulls, weed seeds, chaff, dust and other plant material. The colour ranges from brown to yellow.

Characteristics

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
less than 30°	478 to 719	1.39 to 2.09
Size	**Class**	**Group**
Length: 12 to 38 mm Diameter: 4 to 7 mm	Not applicable	C

Hazard
This cargo flows freely like grain. This cargo is non-combustible or has a low fire-risk.

Stowage and segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather precautions
This cargo shall be kept as dry as practicable. This cargo shall not be handled during precipitation. During handling of this cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed.

Loading
Trim in accordance with the relevant provisions required under sections 4, 5 and 6 of the Code in accordance with the shipper's declaration of the angle of repose.

A certificate from a person recognized by the competent authority of the country of shipment shall be provided by the shipper to the master, prior to loading, confirming that the oil and the moisture contents as described in the schedule have been met.

Precautions
Persons who may be exposed to the dust of the cargo shall wear a dust filter mask, protective eyewear, and protective clothing as necessary.

Carriage
Hatches of the cargo spaces shall be weather tight to prevent water ingress.

Discharge
No special requirements.

Ventilation
No special requirements.

Clean-up
No special requirements.

Emergency Procedures
No special requirements."

"**GRANULATED NICKEL MATTE (LESS THAN 2% MOISTURE CONTENT)**

Description
Crude dark grey nickel product composed of about 55% nickel, 20% copper and 25% other mineral impurities. The material is odourless.

Characteristics

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
Not applicable	2,800 to 4,000	0.25 to 0.36
Size	**Class**	**Group**
Up to 3 mm	MHB	B

Hazard
Contact with the skin may give rise to irritation.
This cargo is non-combustible or has a low fire-risk.
This cargo is moderately toxic by inhalation.

Stowage and segregation
Separated from foodstuffs.

Hold cleanliness
No special requirements.

Weather precautions
No special requirements.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code. As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during voyage and during loading process by a pile of the cargo.

Precautions
Persons who may be exposed to the dust component of the cargo shall wear personal protective equipment including goggles or other equivalent dust eye-protection, respiratory protection, and/or skin protection as necessary. Due consideration shall be paid to prevent dust entering living quarters and enclosed working area. Eating and drinking is prohibited in the cargo work areas. Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo.

Carriage
No special requirements.

Discharge
No special requirements.

Ventilation
No special requirements.

Clean-up
No special requirements.

Emergency procedures

Special emergency equipment to be carried Protective clothing (gloves, boots, coveralls) Self-contained breathing apparatus
Emergency procedures Wear protective clothing and self-contained breathing apparatus. **Emergency action in the event of fire** Nil (non-combustible) **Medical First Aid** Refer to the *Medical First Aid Guide (MFAG)*, as amended.

"

"**GYPSUM GRANULATED**

Description
Gypsum Granulated made from calcium sulphate hydrate which is produced artificially or industrial by-product. It is produced by granulating and processing such calcium sulphate hydrate until its grain size becomes 10 mm diameter or more. Insoluble in water.

Characteristics

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
Not applicable	310 to 1,200	0.83 to 3.23
Size	**Class**	**Group**
Greater than 10 mm	Not applicable	C

Hazard
No special hazards.
This cargo is non-combustible or has a low fire-risk.

Stowage and segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather precautions
No special requirements.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

Precautions
No special requirements.

Ventilation
No special requirements.

Carriage
No special requirements.

Discharge
No special requirements.

Clean-up
No special requirements."

"**ILMENITE (ROCK)**

Description
Ilmenite (Rock) is obtained from mine blasting followed by crushing. It has a black colour. It may be smelted in electric arc furnaces or can be used in blast furnaces.

Characteristics

Angle of repose	**Bulk density (kg/m^3)**	**Stowage factor (m^3/t)**
Not applicable	2,400 to 3,200	0.31 to 0.42
Size	**Class**	**Group**
Up to 100 mm	Not applicable	C

Hazard
This cargo has no special hazards.
This cargo is non-combustible or has a low fire-risk.

Stowage and segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather precautions
No special requirements.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code. As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during voyage and during loading by a pile of the cargo.

Precautions
Avoid breathing dust. Persons who may be exposed to the dust of the cargo shall wear a dust filter mask, protective eyewear and clothing as necessary.

Ventilation
No special requirements.

Carriage
No special requirements.

Discharge
No special requirements.

Clean-up
No special requirements."

"**ILMENITE (UPGRADED)**

Description
Ilmenite (upgraded), is obtained from the smelting of rock or sand Ilmenite into electric arc furnaces. Ilmenite (upgraded) has a granular form and its colour varies from black (normal grades) to brown-orange for its purified grade.

Ilmenite (upgraded) is also known as Titanium slag, Titanium Ore Concentrate, Chloride Slag, Sulphate Slag, High Grade Sulphate Slag, Slag fines, Slag ilmenite electro thermal smelting or TiO_2 slag.

Characteristics

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
Not applicable	1,860 to 2,400	0.41 to 0.54
Size	**Class**	**Group**
Up to 12 mm	Not applicable	A

Hazard
This material may liquefy if shipped at moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of this Code.

This cargo is non-combustible or has a low fire-risk.

Stowage and segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather precautions
This cargo shall be kept as dry as practicable before loading, during loading and while on the voyage. When a cargo is carried in a ship other than a specially constructed or fitted cargo ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

.1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;

.2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;

.3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;

.4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and

.5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code. As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during voyage and during loading by a pile of the cargo.

Precautions
Bilge wells shall be clean, dry and covered as appropriate to prevent ingress of the cargo. Avoid breathing dust. Persons who may be exposed to the dust component of the cargo shall wear personal protective equipment including goggles or other equivalent dust eye-protection and respiratory protection as necessary. Wash hands and face before eating, drinking or smoking.

Ventilation
No special requirements.

Carriage
The appearance of the cargo shall be checked regularly during voyage. If free water above the cargo or fluid state of the cargo is observed during voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge.

Discharge
No special requirements.

Clean-up
No special requirements."

"**NICKEL ORE**

Description
Nickel ore varies in colour. There are several types of ore of variable particle size and moisture content. Some may contain clay-like ores. For concentrates, see NICKEL CONCENTRATE.

Characteristics

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
Not applicable	1,400 to 1,800	0.55 to 0.71
Size	**Class**	**Group**
Various	Not applicable	A

Hazard
This material may liquefy if shipped at a moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of this Code. This cargo is non-combustible or has a low fire-risk.

Stowage and segregation
No special requirements.

Hold cleanliness
Cargo spaces must be clean and dry.

Weather precautions
When a cargo is carried in a ship other than a specially constructed or fitted cargo ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

.1 all measures shall be taken during loading operations and the voyage to avoid an increase in the moisture content of the cargo;

.2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;

.3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;

.4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and

.5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

When the stowage factor of this cargo is equal or less than 0.56 m^3/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo.

Precautions
Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo. The bilge system of a cargo space to which this cargo is to be loaded shall be tested to ensure that it is working.

Ventilation
The cargo spaces carrying this cargo shall not be ventilated during voyage.

Carriage
The appearance of the surface of this cargo shall be checked regularly during voyage. If free water above the cargo or fluid state of the cargo is observed during voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge.

Discharge
No special requirements.

Clean-up
No special requirements."

"**SAND, HEAVY MINERAL**

Description
The cargo is generally a blend of two or more heavy mineral sands. Such sands are characterized by their heavy bulk density and relatively fine grain size.
Abrasive. May be dusty.

Characteristics

Angle of repose	**Bulk density (kg/m^3)**	**Stowage factor (m^3/t)**
Not applicable	2,380 to 3,225	0.31 to 0.42
Size	**Class**	**Group**
Up to 5 mm	Not applicable	A

Hazard
This cargo may liquefy if shipped at a moisture content in excess of its TML. See sections 7 and 8 of this Code.

This cargo is non-combustible or has a low fire-risk.

Stowage and segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather precautions
When a cargo is carried in a ship other than a specially constructed or fitted cargo ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

.1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;

.2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;

.3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;

.4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and

.5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that tank top is not overstressed during voyage and during loading by a pile of the cargo.

Precautions
Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo.

Ventilation
No special requirements.

Carriage
The appearance of the surface of this cargo shall be checked regularly during voyage. If free water above the cargo or fluid state of the cargo is observed during voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge.

Discharge
No special requirements.

Clean-up
No special requirements."

"**SILICON SLAG**

Description
Silicon slag is an odourless greyish metallic material mainly in lump. It is composed of silicon and silicon dioxide in variable proportions.

Characteristics

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
Not applicable	2,300 to 3,000	0.33 to 0.43
Size	**Class**	**Group**
Up to 150 mm	Not applicable	C

Hazard
The dust may cause irritation of eyes, skin and upper respiratory tract.
This cargo is non-combustible or has a low fire-risk.

Stowage and segregation
"Separated from" acids or base materials.

Hold cleanliness
No special requirements.

Weather precautions
No special requirements.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code. As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during the voyage and during the loading process by a pile of the cargo.

Precautions
Persons who may be exposed to the dust of the cargo shall wear protective clothing, goggles or other equivalent dust eye-protection and dust filter mask as necessary.

Ventilation
No special requirements.

Carriage
No special requirements.

Discharge
No special requirements.

Clean-up
No special requirements."

"**SOLIDIFIED FUELS RECYCLED FROM PAPER AND PLASTICS**

This schedule shall not apply to material classified as dangerous goods (Class 4.2).

Description
Solidified fuels comprising papers and plastics by compressing or extruding in moulds. The main raw materials of this cargo are waste paper and plastic. Moisture content is 5% or less. Ash content is 10% or less. Total chlorine is 0.3% or less.

Characteristics

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
Not applicable	400 to 500	2.0 to 2.5
Size	**Class**	**Group**
Length: 30 to 100 mm Diameter: 15 to 30 mm	MHB	B

Hazard
Spontaneous ignition is not liable to occur up to 200°C. When ignited, it burns violently. When melted, it generates flammable and toxic gases. Spontaneous-heating may take place and may deplete oxygen in the cargo spaces.

Stowage and segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather precautions
No special requirements.

Loading
Prior to loading, the manufacturer or shipper shall give the master a certificate stating that the cargo is not class 4.2. Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

Precautions
During handling and carriage, no hot work, burning and smoking shall be permitted in the vicinity of the cargo spaces containing this cargo. After discharging this cargo, entry into cargo spaces shall not be permitted unless they have been sufficiently ventilated.

Ventilation
The hatches of the cargo spaces shall be closed and the spaces shall not be ventilated during voyage.

Carriage
Entry into the cargo spaces shall not be permitted during voyage.

Discharge
The hatches of the cargo spaces shall be opened and sufficiently ventilated prior to entry.

Clean-up
No special requirements.

Emergency procedures

Special emergency equipment to be carried Protective clothing (protective glasses, heat-resistant gloves, coveralls).
Emergency procedures Wear protective clothing. **Emergency action in the event of fire** Batten down; use ship's fixed fire-fighting installation, if fitted. Extinguish fire with water, foam or dry chemicals. **Medical First Aid** Refer to the Medical First Aid Guide (MFAG), as amended.

"

"WOOD TORREFIED

Description
Wood torrefied is wood that has been partially burned or roasted and formed into pellets or briquettes. Chocolate brown or black in colour. May contain up to 3% binder.

Characteristics

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
35° or less	650 to 800	1.25 to 1.54
Size	**Class**	**Group**
Pellets with a diameter of 6 to 12 mm. Briquettes with a thickness of 12 to 50 mm and a length and width up to 75 mm.	MHB	B

Hazard
Shipments may be subject to oxidation leading to depletion of oxygen and increase of carbon monoxide and carbon dioxide in cargo and adjacent spaces.

Wood torrefied is readily combustible and may self-heat and spontaneously combust.

Handling of wood torrefied may cause dust to develop with a subsequent risk of dust explosion when loading. Dust may cause eye, skin and respiratory irritation.

Stowage and segregation
Segregation as for class 4.1 materials.

Hold cleanliness
Clean and dry as relevant to the hazards of the cargo.

Weather precautions
This cargo shall be kept as dry as practicable. This cargo shall not be handled during precipitation. During handling of this cargo, all non-working hatches of the cargo spaces into which this cargo is loaded or to be loaded shall be closed.

Loading
Trim in accordance with the relevant provisions required under sections 4, 5 and 6 of the Code.

Precautions
Entry of personnel into cargo and adjacent confined spaces shall not be permitted until tests have been carried out and it has been established that the oxygen content and carbon monoxide levels have been restored to the following levels: oxygen 20.7% and carbon monoxide <100 ppm. If these conditions are not met, additional ventilation shall be applied to the cargo hold or adjacent confined spaces and remeasuring shall be conducted after a suitable interval. An oxygen and carbon monoxide meter shall be worn and activated by all crew when entering cargo and adjacent enclosed spaces.

Persons who may be exposed to the dust of the cargo shall wear protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

Ventilation
Ventilation of enclosed spaces adjacent to a cargo hold before entry may be necessary even if these spaces are apparently sealed from the cargo hold.

Carriage
Hatches of the cargo spaces carrying this cargo shall be weathertight to prevent the ingress of water.

Discharge
No special requirements.

Clean-up
No special requirements.

Emergency procedures

Special emergency equipment to be carried Self-contained breathing apparatus and combined or individual oxygen and carbon monoxide meters should be available.
Emergency procedures Nil **Emergency action in the event of fire** Batten down; use ship's fixed fire-fighting installation, if fitted. Exclusion of air may be sufficient to control fire. Extinguish fire with carbon dioxide, foam or water. **Medical First Aid** Refer to the Medical First Aid Guide (MFAG), as amended.

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Appendix 3 – Properties of solid bulk cargoes

1 Non-cohesive cargoes

49 In paragraph 1.1, the new following Bulk Cargo Shipping Names are inserted in alphabetical order:

"GRAIN SCREENING PELLETS"
"WOOD TORREFIED"

Appendix 4 – Index

50 Include in ALUMINA HYDRATE a synonym as:

"Aluminium hydroxide"

51 Insert an additional name under SAND as:

"

Material	Group	References
Spodumene	C	*see* SAND

"

52 In the line for SILICOMANGANESE in the line for Material, amend the Bulk Shipping Name to read "SILICOMANGANESE (low carbon)".

53 Include the following names in the alphabetical index:

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Material	Group	References
ALUMINA HYDRATE	A and B	
ALUMINIUM SMELTING / REMELTING BY-PRODUCTS, PROCESSED	A and B	
CLINKER ASH, WET	A and B	
COAL TAR PITCH	B	
COARSE IRON AND STEEL SLAG AND ITS MIXTURE	C	
CRUSHED CARBON ANODES	C	
GRAIN SCREENING PELLETS	C	
GRANULATED NICKEL MATTE (LESS THAN 2% MOISTURE CONTENT)	B	
GYPSUM GRANULATED	C	
ILMENITE (ROCK)	C	
ILMENITE (UPGRADED)	A	
NICKEL ORE	A	
SAND, HEAVY MINERAL	A	
SILICON SLAG	C	
SOLIDIFIED FUELS RECYCLED FROM PAPER AND PLASTICS	B	
WOOD TORREFIED	B	

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